Appendix 1

BIOTIC INTEGRITY REPORT

Main Salmon River-Chamberlain (HUC 17060207)

Idaho County, Idaho

Subbasin Assessment

Biotic Integrity (Macroinvertebrates)

Idaho Division of Environmental Quality

State Technical Services Office

2000

Printed on recycled paper

Main Salmon River-Chamberlain (HUC 17060207)
Idaho County, Idaho

Subbasin Assessment

Biotic Integrity (Macroinvertebrates)

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Abstract

The macroinvertebrates of several streams in the Main Salmon River-Chamberlain area were sampled as part of the Beneficial Use Reconnaissance Project (BURP) by the Idaho Division of Environmental Quality (DEQ) during July 1996 and July 1997. The streams were compared with each other and the literature for taxa richness and tolerance to fine sediment and temperature. Crooked Creek appears to be impacted by fine sediment the most of the streams examined in this study. Big Creek, Big Mallard Creek, Rhett Creek, which were listed on the 1998 303(d) list do not appear to be impaired by fine sediment. Crooked Creek, Jersey Creek, Little Mallard Creek, and Warren Creek were also included on the 1998 303(d) list but are more difficult to place in an impairment category. Additional study is suggested for these four streams. Of the streams studied which were not listed on the 1998 303(d) list, Bear Basin Creek, Corn Creek, Eutopia Creek, McGuire Creek**,** and Noble Creek do not seem to be impacted by fine sediment. The information on Cramer Creek gives a mixed signal and additional study is suggested for it in order to properly place it into the proper impairment category.

Introduction

The macroinvertebrates of several streams in the Main Salmon River-Chamberlain area were sampled as part of the Beneficial Use Reconnaissance Project (BURP) by the Idaho Division of Environmental Quality (DEQ), Idaho Falls Regional Office during July 1996 and the Lewiston Regional Office during July 1997. The State Office of the DEQ are using these data, in part, to prepare a subbasin assessment of the Main Salmon River-Chamberlain. A total of 11 of the 17 stream segments were listed in the 1998 303(d) list (Idaho Division of Environmental Quality 1999). Six of the streams (nine sites/segments) were listed for sediment and one stream (two sites/segments) for habitat alteration, a result, in part, of past mining activity in the area. The present report is an analysis of the macroinvertebrate data available from the BURP sampling efforts.

Materials and Methods

Study Area

The study area is in Hydrologic Unit Code (HUC) 17060207 in the Main Salmon River-Chamberlain area, Idaho County, Idaho. The Majority of the area lies within the Nez Perce and Payette National Forests and some of the sites are located in the Frank Church River of No Return Wilderness. Seventeen stream sites were sampled on 13 streams for macroinvertebrates for this project (Table 1). The Beneficial Use Reconnaissance Project site identification number is included for reference

Methods

Macroinvertebrate sample methods follow Clark and Maret (1993) and Beneficial Use Reconnaissance Project Technical Advisory Committee (1997). Three Hess samples were taken and combined for each of three separate riffles. Macroinvertebrates were processed by EcoAnalysts, Inc. of Moscow, Idaho. Voucher specimens of the macroinvertebrates have been deposited in the Orma J. Smith Museum of Natural History, Albertson College of Idaho, Caldwell.

The Macroinvertebrate sample metrics were interpreted consistent with current literature. Clark (1997) provides a draft list of cold water macroinvertebrate indicators for Idaho. Hafele and Hinton (1996), Oregon Watershed Enhancement Board (1999), Relyea (1999), and Wisseman (1996) were especially helpful in determining the tolerance of the invertebrates collected to fine sediment. Tables 3 and 4 list a variety of metrics examined for this study.

The Macroinvertebrate Biotic Index (MBI) scores were calculated using Idaho Division of Environmental Quality (1996) water body assessment guidance process. The MBI uses the seven metrics discussed in detail above (taxa richness, EPT index, percent EPT, percent scrapers, percent dominant taxa, the Hilsenhoff Biotic Index, and Shannon's H' diversity index. In summary, this process was developed by DEQ as a non-arbitrary, objective water body assessment tool. An MBI score of 2.5 or less renders an impaired call for aquatic life (cold water biota in most cases). An MBI score of 3.5 or greater is determined to be not impaired. If a score falls between 2.5 and 3.5 the site was considered to close to determine and given a rating of Aneeds verification≅ (Idaho Division of Environmental Quality 1999).

Cold water indicators (Table 2) are compared with a draft list prepared for Idaho (Clark 1997) and Hafele and Hinton (1996). Essig (1998) is a good reference for examination of the dilemma associated with temperature criteria in Idaho. Clark (1999a) provides information useful for determining the identification and distribution of aquatic macroinvertebrates in Idaho.

The macroinvertebrate metrics currently used by DEQ to calculate the Macroinvertebrate Biotic Index include: percent Ephemeroptera, Plecoptera, and Trichoptera (EPT), modified Hilsenhoff Biotic Index (HBI), percent scrapers, percent dominance, EPT index, taxa richness, and Shannon's H' diversity index. In addition to those metrics, I have also examined six additional (total abundance, percent Ephemeroptera, percent Plecoptera, percent Trichoptera, number of Ephemeroptera taxa, and number of Plecoptera taxa) that provide additional information concerning the sites studied. The metrics examined can be separated into four categories: richness, composition, tolerance, and trophic/habitat.

Richness (or community structure)

Taxa Richness reflects the health of the assemblage through a measure of the variety of taxa (total number of distinct genera or species) present. Taxa Richness can be equated to biodiversity. Taxa Richness generally increases with increasing water quality, habitat diversity, or habitat suitability. Barbour *et al*. (1992) and Karr and Chu (1999) report that Taxa Richness is a reliable indicator of human influence in the Pacific Northwest and will generally decrease with an increase in such influence. The EPT (Ephemeroptera, Plecoptera, Trichoptera) Index is a metric which summarizes the taxa richness of these three orders of insects that are generally considered to be sensitive to pollution (including temperature and fine sediment). Barbour *et al*. (1992) reports that EPT Index is a reliable indicator of human influence in the Pacific Northwest and will generally decrease with an increase in such influence. It follows then that the number of Ephemeroptera Taxa and the number of Plecoptera Taxa will likewise be good indicators of temperature and fine sediment pollution. It is sometimes helpful to look at these taxa separately even though they are considered in the two previously mentioned metrics. Karr and Chu (1999) show that these three metrics are reliable indicators of human influence across the Pacific Northwest, including Central Idaho. Another way to measure diversity is with Shannon's H' Diversity Index. This metric is based on the observation that relatively undisturbed environments support communities having great taxa richness with no individual species present in overwhelming abundance. It has been one of the most popular diversity indices used for water quality assessment.

Composition

Percent EPT increases as water quality increases, since these groups generally contain taxa that are considered more sensitive to temperature and fine sediment pollution. Karr and Chu (1999) show that these taxa decreased with increased human influence in the Pacific Northwest. They show the same relationship between intolerant taxa (which include EPT). It likewise follows, that each of the EPT groups examined separately (Percent Ephemeroptera, Percent Plecoptera, and Percent Trichoptera) will also show the same trend in relation to temperature and fine sediment pollution. It may be useful to examine these metrics separately at times. Total Abundance of macroinvertebrate organisms in a sample can also serve as an indicator of stream health. Generally greater Total Abundance will indicate a stream of decreased impact and increased water quality. There comes a point (this is dependent on the particular stream, impacts, and taxa present) where larger Total Abundance indicates a decrease in water quality. This condition is evident when pollution (which includes temperature and fine sediment) has reduced or eliminated the sensitive species and the remaining tolerant species thrive with the resulting reduced competition.

Tolerance

The Hilsenhoff Biotic Index (HBI) was originally a measure of organic pollution. It has been modified several times. Each macroinvertebrate taxon is assigned a tolerance value relating to the response to organic and toxic pollutants. A value of 0-10 may be assigned to each taxon, with 0 being the least tolerant to pollution (inverse relationship). A score of 11 indicates the tolerance value is unknown. These have also been shown to be useful for evaluating both point and nonpoint source affects. U.S. Environmental Protection Agency (1997) and Barbour *et al*. (1999) indicate that the HBI is useful in determining the impacts of nonpoint source pollution. Percent Dominance represents the percent contribution of the numerically dominant taxon to the total number of individuals in the community. It provides an indication of community balance at the lowest positive taxonomic level (usually genus or species). A community (assemblage) dominated by relatively few species would suggest environmental stress. Percent Dominance will increase with the impacts of human influence on streams in the Pacific Northwest (Karr and Chu 1999).

Trophic/Habitat

Percent Scrapers uses the functional feeding group approach to assessment. The relative abundance of scrapers provides an indication of the riffle community food base (periphyton or primary production composition). Scrapers increase with increased abundance of diatoms and decrease as filamentous algae and aquatic mosses increase. Scrapers decrease in relative abundance following increases in fine particle sedimentation in coarse particle substrate stream beds. Percent Scrapers has been shown to be sensitive to human influence in Central Idaho (Karr and Chu 1999).

Results and Discussion

A total of 17 stream sites (13 streams) were sampled during July 1996 and July 1997 for macroinvertebrates (Table 1). Hafele and Hinton (1996), Relyea (1999), Oregon Watershed Enhancement Board (1999), and Wisseman (1996) were especially helpful in determining tolerance of the invertebrates collected to fine sediment. For this discussion I am assuming that the higher the taxa richness, Plecoptera (stonefly) richness, number and percentage of cold water indicator taxa, and percent EPT taxa found at a site relates to those that are less impacted by clean bedload sediment. Macroinvertebrate biotic index scores are listed in Tables 2 and 3. Cold water indicators (Table 4) are compared with a draft list prepared for Idaho (Clark 1997). EPT (Ephemeroptera, Plecoptera, and Trichoptera) will also be examined for water quality significance. Tables 5 and 6 list a variety of metrics examined for this study. For a regional comparison of the above data, Platts and Rountree (1974) was consulted.

Following is a list of sampled streams and a summary of their macroinvertebrate data as they relate to sediment impacts, water temperature tolerance, and the Idaho 303(d) list. The streams have been separated in the following discussion depending on their inclusion (or not) on the 1998 303(d) list (Idaho Division of Environmental Quality 1999):

STREAMS INCLUDED ON THE 303(d) LIST:

Big Creek

Two sites on Big Creek were sampled, one in the upper part of the stream and one in the lower section. The upper site had an MBI score of 4.61 and the lower site had an MBI score of 5.07, both qualifying the stream as not impaired. The two sites are similar in composition with 38 and 37 taxa, respectively, and each with six Plecoptera taxa (Tables 3, 4). The upper site has twice the number of individuals as compared to the lower site and has a higher percentage of Plecoptera (29 compared to 17). From these data the upper site appears less impacted by fine sediment as compared to the lower site. Yet both sites have both sediment tolerant (Diptera and Oligochaeta, for example) and intolerant (Peltoperlidae and *Drunella* spp. for example) taxa present. The stream, as a whole, appears to be not impacted by fine sediment.

Big Mallard Creek

Two sites on Big Mallard Creek were sampled, one in the upper part of the stream and one in the lower section. The upper site had an MBI of 5.31 and the lower site had an MBI of 5.06, both near the top scores for this study (Tables 2, 3) Like Big Creek, the upper site on Big Mallard Creek appears to be in better condition as compared to the lower site. Taxa richness is 43 in the upper as compared to 30 in the lower site. Plectoptera richness is eight at the upper site and six at the lower site. Big Mallard Creek had few cold water indicators (four taxa at the upper site and only one taxon at the lower site for 2.3% and 1.2%, respectively, of the total). Both sites did have *Drunella doddsi* present, indicating cold water (Clark 1997) and low sediment (Oregon

Watershed Enhancement Board 1999). From these preliminary data, Big Mallard Creek can be considered to be not impacted by fine sediment.

Crooked Creek

Two sites on Crooked Creek were sampled, one in the upper part of the stream and one in the lower section. The upper site had an MBI score of 4.46 and the lower site had an MBI score of 4.92, indicating that the stream is not impaired. Crooked Creek appears to be more impacted by fine sediment than Big Creek and Big Mallard Creek. Taxa richness is 29 and 34, respectively, and both sites have only four Plecoptera taxa present (low for this study) (Tables 5, 6). Crooked Creek had totals of one and zero, respectively, cold water indicator taxa which made up 0.7% and zero%, respectively, of the total fauna at the site. Crooked Creek appears to be heavily impacted by fine sediment. Crooked Creek seems to be an enigma in our data analysis system. The stream has high MBI scores yet very low cold water indicator numbers. I would suggest additional sampling might help explain the conflicting results presented here.

Jersey Creek

Jersey Creek had an MBI score of 4.93 indicating that it is not impaired by fine sediment. Jersey Creek had a high taxa richness (40) and number of Plecoptera taxa present (nine). It had the highest total percent EPT found in this study. Many of the EPT taxa found are tolerant of fine sediment. The percent of the total organisms collected that are Plecoptera (7.6%) seems low as compared to the other sites. Jersey Creek had a total of three cold water indicator taxa which made up 4.3% of the total fauna at the site. From these preliminary data it appears that Jersey Creek is similar to Crooked Creek as far as our ability to relate it to fine sediment impacts.

Little Mallard Creek

Little Mallard Creek had a low MBI score for this study (4.25) yet a value high enough to place it in the not impaired category. Little Mallard Creek had good Plecoptera richness (9 taxa) yet low total richness (28 taxa) for this area (Tables 5, 6). Total abundance (284) was near the lower end (minimum = 249) for this survey (Table 2). The stream has a waterfall which precludes fish passage. The invertebrate samples were taken above the waterfall in the portion of the stream that has no fish (Daniel Stewart, Personal Communication, 29 November 1999). Little Mallard Creek had a total of four cold water indicator taxa which made up 25% of the total fauna at the site.

Little Mallard Creek seems to have some impacts from fine sediment, since this stream had low total richness and low total abundance of macroinvertebrates and yet apparently no predation by fish. I conclude that Little Mallard Creek is impacted by fine sediment but enough habitat exists to yield good MBI scores. Additional sampling for macroinvertebrates might give additional information to solve this apparent inconsistency in the data.

Rhett Creek

Rhett Creek had a high MBI value of 5.13 (second high for this study, Tables 2, 3). Rhett Creek had a very high total taxa richness (45) and a high total abundance (528) when compared with the other streams listed on the 303(d) list from this area. It had a lower number of Plecoptera taxa present (7) as compared with those streams not on the 303(d) list (see below). But, Rhett Creek had a total of six cold water indicator taxa which made up 18% of the total fauna at the site. Rhett Creek does not appear to be impacted by fine sediment.

Warren Creek

Two sites on Warren Creek were sampled, one in the upper part of the stream and one in the lower section. The upper site had an MBI score of 4.99 and the lower site a nearly identical score of 4.93 (Tables 2, 3). This stream gave mixed signals concerning its biotic condition: The lower site had better taxa richness as compared with the upper site (43 and 29 respectively) and had a higher percent EPT (59.4 as compared to 48.6 respectively). These differences may indicate that the impacts to the stream did not occur at the same time. On the other hand, the upper site had more Plecoptera taxa (6) as compared to the lower site (5) and double the total abundance. Warren Creek had a total of seven and two cold water indicator taxa, respectively, which made up 4.2% and 3.2%, respectively, of the total fauna at the site which is low for a stream in this area in good condition. Additional sampling for macroinvertebrates might give additional information to solve this apparent inconsistency in the data.

STREAMS NOT INCLUDED ON THE 303(d) LIST:

Bear Basin Creek

Bear Basin Creek had the next to lowest MBI score, 4.02 (Tables 2, 3). The site has a good group of intolerant macroinvertebrate taxa present (EPT - 51%) including three stonefly taxa (which is a low for this study) (Table 6). Bear Basin Creek has a good number of cold water indicator taxa (6) but a lower percent of the total (15%) than most of the other sites (Table 4). Hence, this stream does not seem to be impacted by fine sediment.

Corn Creek

Corn Creek had a high MBI score, 5.07 (Tables 2, 3). The site had a much higher proportion of intolerant taxa (EPT - 83%) (including *Drunella doddsi*) as compared to tolerant taxa (Table 6). The site also has a good number of cold water indicator taxa (7) but a lower percent of the total (14%) (Table 4). Hence, this stream does not seem to be impacted by fine sediment.

Cramer Creek

Cramer Creek had the lowest MBI score for this study (3.17) (Tables 2, 3). The MBI score places the stream into the needs verification category. I would suggest that additional samples be taken on Cramer Creek at several sites to allow us to place the stream in either the impaired or not impaired category. The site presents a very mixed signal from the samples taken so far in that it has some very pollution tolerant taxa (Diptera, Trichoptera, Coleoptera, and Oligochaeta). The one mayfly present, *Baetis tricaudatus*, is a tolerant taxon. Yet, the site has good Plecoptera diversity (five taxa and 75% of the total). More study is needed to be able to properly determine the condition of this stream.

Eutopia Creek

Eutopia Creek had an MBI score of 4.77 which places it into the not impaired class. Eutopia Creek has the highest number of Plecoptera taxa (12), tied with Noble Creek (Table 6). Eutopia Creek had a relatively high total taxa richness (35) and a good percent Plecoptera (33.3) (Table 4). Eutopia Creek had a total of nine cold water indicator taxa which made up 46% of the total fauna at the site. Eutopia Creek seems to be similar in minimal impact by fine sediment as McGuire and Noble Creeks, and appears to be in much better condition than the streams on the 303(d) list. I conclude that Eutopia Creek is not impacted by fine sediment.

McGuire Creek

McGuire Creek had the next highest number of Plecoptera taxa (11) as compared to the 14 stream sites examined. McGuire Creek had a total of six cold water indicator taxa which made up 29% of the total fauna at the site. McGuire Creek seems to be similar in minimal impact by fine sediment as Eutopia and Noble Creeks, and appears to be in much better condition than the streams on the 303(d) list. I conclude that McGuire Creek is not impacted by fine sediment.

Noble Creek

Noble Creek had an MBI score of 5.57, the highest for this study (Tables 2, 3). Noble Creek was tied with Eutopia Creek for the highest number of Plecoptera taxa (12) (Table 6). It had a percent Plecoptera of 31 (Table 6). Noble Creek had the highest taxa richness (50) of any of the stream sites examined during this study (Table 5). Noble Creek had a total of eight cold water indicator taxa present which made up 22% of the fauna at the site (Table 4). I conclude that Noble Creek is not impacted by fine sediment.

Conclusions and Recommendations

1. All stream sites examined, except for Cramer Creek, had macroinvertebrate biotic index scores in the not impaired (score of 3.5 and above) category.

2. Of the seven streams listed on the 1998 303(d) list, Big Creek, Big Mallard Creek, and Rhett Creek do not appear to be impacted by fine sediment and should be considered not impaired.

3. The remaining streams listed on the 1998 303(d) list, Crooked Creek, Jersey Creek, Little Mallard Creek, and Warren Creek are difficult to assign to an impairment category because the samples were a mix of both tolerant and intolerant taxa. Additional study is suggested to resolve these assessments.

4. For streams not listed on the 1998 303(d) list, Bear Basin Creek, Corn Creek, Eutopia Creek, McGuire Creek and Noble Creek, do not seem to be impacted by fine sediment and are considered not impaired.

5. Cramer Creek was likewise not listed on the 1998 303(d) list but gives a mixed signal and additional study is recommended to help determine the stream's status.

Acknowledgments

EcoAnalysts, Inc. (Gary Lester) provided the macroinvertebrate identifications of the 1996 specimens and Wease Bollman provided the identifications of the 1997 samples presented here. The Grangeville DEQ Regional Office BURP crew took the field samples. Daniel Stewart and Steve Robinson coordinated the field work. Barry Burnell, Mark Shumar, Todd Maguire, and Daniel Stewart assisted with data summary. Steve Osborne assisted with editorial help.

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Table 1. 1999 Macroinvertebrate collections for the Main Salmon River-Chamberlain area, Idaho, July 1996 and July 1997 (HUC 17060207).

STREAM	SITE	SITE ID	303(d) Listed Pollutant
Bear Basin Creek	Above Road Crossing	1996SIDFZ099	n/a
Big Creek	Lower-upper	1997SLEWA014	Sediment
Big Creek	Upper-upper	1997SLEWA015	Sediment
Big Mallard Creek Lower		1997SLEWC015	Sediment
Big Mallard Creek Upper		1997SLEWC012	Sediment
Corn Creek	Above Road Crossing	1996SIDFZ098	n/a
Cramer Creek	Above Road Crossing	1996SIDFZ100	n/a
Crooked Creek	Lower	1997SLEWC011	Sediment
Crooked Creek	Upper	1997SLEWC016	Sediment
Eutopia Creek	Above USFS Road 311	1997SLEWA016	n/a
Jersey Creek	Near Mouth	1997SLEWC014	Sediment
Little Mallard Creek	USFS Road 9505	1997SLEWA017	Sediment
McGuire Creek	Above Big Creek	1997SLEWA018	n/a
Noble Creek	USFS Road 421	1997SLEWC013	n/a
Rhett Creek	USFS Trail 231	1997SLEWA013	Sediment
Warren Creek	Lower	1997SLEWA023	Habitat Alteration
Warren Creek	Upper	1997SLEWA022	Habitat Alteration

Table 2. 1999 Macroinvertebrate Biotic Index scores for streams in the Main Salmon River-Chamberlain area, Idaho, July 1996 and July 1997 (HUC 17060207), arranged in alphabetical order by stream name.

STREAM	MBI
Bear Basin Creek	4.02
Big Creek (lower-upper)	5.07
Big Creek (upper-upper)	4.61
Big Mallard Creek (lower)	5.06
Big Mallard Creek (upper)	5.31
Corn Creek	5.07
Cramer Creek	3.17
Crooked Creek (lower)	4.92
Crooked Creek (upper)	4.46
Eutopia Creek	4.77
Jersey Creek	4.93
Little Mallard Creek	4.25
McGuire Creek	4.68
Noble Creek	5.57
Rhett Creek	5.13
Warren Creek (lower)	4.93
Warren Creek (upper)	4.99

Table 3. 1999 Macroinvertebrate Biotic Index scores for streams in the Main Salmon River-Chamberlain area, Idaho, July 1996 and July 1997 (HUC 17060207), arranged from the highest MBI score to the lowest.

STREAM	MBI
Noble Creek	5.57
Big Mallard Creek (upper)	5.31
Rhett Creek	5.13
Big Creek (lower-upper)	5.07
Corn Creek	5.07
Big Mallard Creek (lower)	5.06
Warren Creek (upper)	4.99
Jersey Creek	4.93
Warren Creek (lower)	4.93
Crooked Creek (lower)	4.92
Eutopia Creek	4.77
McGuire Creek	4.68
Big Creek (upper-upper)	4.61
Crooked Creek (upper)	4.46
Little Mallard Creek	4.25
Bear Basin Creek	4.02
Cramer Creek	3.17

Table 4. 1999 Macroinvertebrate cold water indicators for the Main Salmon River-Chamberlain area, Idaho, July 1996 and July 1997 (HUC 17060207).

STREAM	# COLD WATER TAXA	% COLD WATER TAXA
Bear Basin Creek	6	15.22
Big Creek (lower-upper)	9	17.76
Big Creek (upper-upper)	8	21.95
Big Mallard Creek (lower)	1	1.16
Big Mallard Creek (upper)	4	2.33
Corn Creek	7	14.35
Cramer Creek	3	74.18
Crooked Creek (lower)	0	0.0
Crooked Creek (upper)	2	0.99
Eutopia Creek	9	46.02
Jersey Creek	3	1.56
Little Mallard Creek	7	33.45
McGuire Creek	8	31.62
Noble Creek	13	34.35
Rhett Creek	10	24.43
Warren Creek (lower)	2	2.01
Warren Creek (upper)	9	3.81

Table 5. 1999 Macroinvertebrate data (taxa richness, total abundance, HBI, H', percent scrappers) for the Main Salmon River-Chamberlain area, Idaho, July 1996 and July 1997 (HUC 17060207).

Water Body	Taxa Richness	Total Abundance	HBI	H=	Percent Scrappers
303(d) listed					
Big Creek (lower-upper)	37		1.69	1.18	45.39
Big Creek (upper-upper)	38	304	1.54	1.11	22.72
Big Mallard Creek(lower)	30	647	2.18	1.24	47.42
Big Mallard Creek (upper)	43	310	2.54	1.36	34.67
Crooked Creek (lower)	34	300	2.95	1.11	66.08
Crooked Creek (upper)	29	454	2.19	1.09	41.06
Jersey Creek	40	302	4.35	1.00	53.13
Little Mallard Creek	28	512	0.95	1.04	16.2
Rhett Creek	45	284	2.28	1.31	23.48
Warren Creek (lower)	29	528	1.96	1.21	45.78
Warren Creek (upper)	43	249	1.88	1.20	30.85
		551			
Not 303(d) listed					
Bear Basin Creek	23		4.34	0.98	42.55
Corn Creek	28	322	1.36	1.11	46.19
Cramer Creek	15	223	1.9	0.56	8.32
Eutopia Creek	35	457	1.43	1.13	18.91
McGuire Creek	31	402	1.07	1.13	29.04
Noble Creek	50	272	1.99	1.35	17.89
		559			

Table 6. 1999 Macroinvertebrate data (percent EPT, Sum EPT taxa, percent Ephemeroptera, percent Plecoptera, percent Trichoptera, number of Ephemeroptera taxa, number of Plectoptera taxa) for the Main Salmon River-Chamberlain area, Idaho, July 1996 and July 1997 (HUC 17060207).

Water Body	Percent EPT	SumEPTtaxa	%Ephem	%Plec	%Trich	#Plec Taxa
303(d) listed						
Big Creek (lower-upper)	60.53	21	39.80	17.11	3.62	6
Big Creek (upper-upper)	53.17	20	19.78	28.75	4.64	6
Big Mallard Creek(lower)	70.65	19	48.71	20.00	1.94	6
Big Mallard Creek (upper)	62.00	26	39.33	17.67	5.00	8
Crooked Creek (lower)	47.80	20	39.21	7.27	1.32	4
Crooked Creek (upper)	41.06	18	19.87	17.22	3.97	4
Jersey Creek	83.79	25	74.22	7.62	1.95	9
Little Mallard Creek	52.46	18	15.49	35.21	1.76	9
Rhett Creek	54.55	26	21.59	25.57	7.39	7
Warren Creek (lower)	59.44	19	46.59	10.84	2.01	5
Warren Creek (upper)	48.64	26	35.39	8.89	4.36	6
Not 303(d) listed						
Bear Basin Creek	51.24	15	36.96	7.14	7.14	3
Corn Creek	82.96	22	59.64	12.11	11.21	6
Cramer Creek	87.31	9	5.47	74.84	7.0	9
Eutopia Creek	55.47	26	19.15	33.33	2.99	12
McGuire Creek	57.72	20	28.68	25.74	3.31	11
Noble Creek	59.21	35	20.21	31.13	7.87	12

APPENDIX 2

NEZSED MODELS FOR SUB-WATERSHEDS

Main Salmon Basin (17060207) NEZSED Data Discussion
Nez Perce National Forest - 3/7/00
Summary by Jim Paradiso

Sediment projections were based on data in the Nez Perce Watershed Database in April of 1999. Attached spreadsheets include:

Sheet 'Middle Salmon': Each line is a summary of each tributary that discharges into the Main Salmon on the north side of the river. These tributaries are numbered using the Nez Perce National Forest Plan numbering system, and each subwatershed is called a prescription watershed. On this sheet, tributaries composed of more than one prescription watershed are grouped in Cumulative Effects Watersheds (CEW).

Sheet 'Upper CEWS':This sheet lists the CEW's on the upper portion of the sub-basin. The total lines for each CEW are carried over to Sheet 'Middle Salmon'.

Sheet 'Wind CEW': This sheet is of one CEW, Wind River. The totals are carried onto Sheet 'Middle Salmon'.

Data Completeness

The NEZSED model was run based upon the data contained in the Watershed Database in April of 1999. The analysis was also modeled for the year 1999. A review of the present contents of the database indicates that the timber harvest activities for the Jack and Noble Timber sales since 1996 are not in the database. Activities in the database does include all road construction work for these sales.

Column Definitions:

NPNF Area: Acres in the subwatershed that are within the Nez Perce National Forest (NPNF).

Natural Yield: Sediment produced naturally on the landscape, without the influence of man's activities.

Activity yield: The sediment produced that is attributable to mans activities. This includes timber harvest, roads, and planned fires.

Unrouted Yield: Unrouted yield is the amount of sediment mobilized. It may move only a short distance until it is again stored in the watershed, while some of it may travel to the mouth of the watershed, at which time it is said to be 'routed' sediment.

Routed Yield: The sediment that moves out of the drainage.

Total Yield: The sum of the Natural and Activity Yields.

Routing Coefficient: calculated based upon the area in the drainage.

Percent Over Base: equals activity yield/natural yield X 100

Summary of Salmon River 4th HUC				Existing Unrouted and Routed Sediment.								
Watershed #	Name	NPNF Area Acres[1]	NPNF Area Sq Mi	Unrouted Natural[2] t/m²/yr	Unrouted Natural Yield (t/yr)	1999 Unrouted Activity Yield (t/yr)	Routing Coefficient	Routed Natural[2] t/m²/yr	Routed Natural Yield (t/yr)	1999 Routed[3] Activity Yield (t/yr)	1999 Routed Total Yield (t/yr)	Percent Over Base
17060207-75	Sabe Creek CEW	53,218	83.15	106.7	3,209.7	0.4	0.45	48.1	1,448.4	0.2	1,448.6	0.0%
17060207-04-14	Nixion Creek	1,284	2.01	68.9	138.1	0.0	0.88	60.7	121.9	0.0	121.9	0.0%
17060207-04-15	Bear Creek	2,278	3.56	60.0	213.4	0.0	0.80	47.7	169.8	0.0	169.8	0.0%
17060207-04-16	Deer Park Creek	1,056	1.65	73.0	120.4	0.0	0.91	66.7	110.0	0.0	110.0	0.0%
17060207-04-17	Rattlesnake Creek	6,013	9.40	47.0	441.2	0.0	0.67	31.4	294.8	0.0	294.8	0.0%
17060207-04	Bargamin Creek CEW	69,959	109.31	35.3	3,864.1	9.2	0.43	15.2	1,659.9	4.0	1,663.9	0.2%
17060207-04-19	Bailey Creek	2,243	3.50	68.5	240.1	0.0	0.80	54.7	191.6	0.0	191.6	0.0%
17060207-04-20	Myers Creek	3,204	5.01	36.8	184.0	0.0	0.75	27.5	137.7	0.0	137.7	0.0%
17060207-04-99	Salmon River Face 0207-04	8,272	12.93	63.6	821.9	0.0	1.00	63.6	821.9	0.0	821.9	0.0%
17060207-03-08	Five Mile Creek	1,427	2.23	59.0	131.5	0.0	0.87	51.0	113.8	0.0	113.8	0.0%
17060207-03	Big Mallard Creek CEW	36,530	57.08	21.6	1,230.9	42.9	0.48	10.4	594.4	20.7	615.1	3.5%
17060207-03-10	Little Mallard Creek	8,215	12.84	22.7	291.9	5.7	0.63	14.4	184.4	3.6	188.0	2.0%
17060207-03-11	Elkhorn Creek	2,743	4.29	25.2	108.0	0.0	0.77	19.4	83.1	0.0	83.1	0.0%
17060207-03-12	Slide Creek	557	0.87	38.1	33.1	0.0	1.00	38.1	33.1	0.0	33.1	0.0%
17060207-03-13	Groundhog Creek	248	0.39	16.6	6.4	0.0	1.00	16.6	6.4	0.0	6.4	0.0%
17060207-03	Rhett CEW	12348	19.29	23.0	444.1	3.3	0.59	13.5	260.7	1.9	262.6	0.7%
17060207-03-17	Blowout Creek	4,741	7.41	36.1	267.6	0.1	0.70	25.2	186.6	0.1	186.7	0.0%
17060207-03-18	Paine Creek	715	1.12	67.2	75.0	0.0	0.98	65.8	73.5	0.0	73.5	0.0%
17060207-03-19	Boise Creek	826	1.29	55.0	71.0	0.0	0.96	52.5	67.8	0.0	67.8	0.0%
17060207-03-20	No Man's Creek	606	0.95	69.4	65.7	0.0	1.00	69.4	65.7	0.0	65.7	0.0%
17060207-03-21	TePee Creek	1,906	2.98	48.1	143.1	1.5	0.82	39.5	117.6	1.2	118.8	1.0%
17060207-03-22	Jersey Creek	10,001	15.63	33.6	524.4	20.0	0.61	20.5	319.7	12.2	331.9	3.8%
17060207-03-23	Cove Creek	2,581	4.03	47.6	192.1	2.3	0.78	37.1	149.5	1.8	151.3	1.2%
17060207-03-99	Salmon River Face 0207-03	10,598	16.56	62.0	1,026.4	4.3	1.00	62.0	1,026.4	4.3	1,030.7	0.4%
17060207-02-10	Unname No. 10	856	1.34	73.0	97.6	0.0	0.95	69.3	92.6	0.0	92.6	0.0%
17060207-02-11	Unname No. 11	876	1.37	72.2	98.8	0.0	0.95	68.2	93.4	0.0	93.4	0.0%
17060207-03-16	Indian CEW	5,407	8.45	68.6	579.4	0.1	0.68	46.7	394.6	0.1	394.7	0.0%
17060207-02-13	Cougar Creek	2,341	3.66	73.2	267.8	0.0	0.79	58.0	212.0	0.0	212.0	0.0%
17060207-02-14	Rattlesnake Creek	499	0.78	72.8	56.8	0.0	1.00	72.8	56.8	0.0	56.8	0.0%
17060207-02	Crooked Creek CEW	79,487	124.20	29.8	3,705.4	162.0	0.42	12.5	1,555.6	68.0	1,623.6	4.4%
17060207-02-16	Basin Creek	1,449	2.26	85.0	192.4	0.0	0.86	73.4	166.1	0.0	166.1	0.0%
17060207-02-17	Whiskey Bob Creek	717	1.12	85.0	95.2	0.0	0.98	83.3	93.3	0.0	93.3	0.0%
17060207-02-99	Salmon River Face 0207-02	3,367	5.26	61.1	321.6	0.0	1.00	61.1	321.6	0.0	321.6	0.0%
17060207-02	Bull Creek CEW	9,774	15.27	73.0	1,114.1	0.0	0.61	44.7	682.1	0.0	682.1	0.0%
17060207-01-11	T-Bone Creek	421	0.66	85.0	55.9	0.0	1.00	85.0	55.9	0.0	55.9	0.0%
17060207-01-10	Unnamed No. 10	822	1.28	85.0	109.2	0.0	0.96	81.3	104.4	0.0	104.4	0.0%
17060207-01-09	Elk Creek	3,913	6.11	85.0	519.7	0.0	0.72	61.4	375.2	0.0	375.2	0.0%
17060207-01	Sheep Creek CEW	32,974	51.52	72.2	3,720.8	0.5	0.49	35.5	1,830.1	0.2	1,830.4	0.0%
17060207-01-14	Johnson Creek	1,593	2.49	82.0	204.2	0.0	0.85	69.6	173.3	0.0	173.3	0.0%
17060207-01-15	Wisdom Creek	460	0.72	85.0	61.1	0.0	1.00	85.0	61.1	0.0	61.1	0.0%
17060207-01-16	Cherry Creek	624	0.98	85.0	82.9	0.0	1.00	85.0	82.9	0.0	82.9	0.0%
17060207-01-17	Chittam Creek	1,228	1.92	85.0	163.1	0.0	0.89	75.6	145.0	0.0	145.0	0.0%
17060207-01-18	Vinegar Creek	583	0.91	85.0	77.4	0.0	1.00	85.0	77.4	0.0	77.4	0.0%
	Wind River CEW	41,347	64.60	37.9	2,445.3	47.4	0.47	17.9	1,154.7	22.4	1,177.1	1.9%
17060207-01-20	Bullion Creek	1,011	1.58	50.6	80.0	2.0	0.92	46.6	73.6	1.8	75.5	2.5%
17060207-01-21	Witscher Creek	1,311	2.05	54.2	111.1	5.5	0.88	47.7	97.6	4.8	102.5	5.0%
17060207-01-22	Scott Creek	996	1.56	53.6	83.5	5.3	0.92	49.5	77.1	4.9	82.0	6.3%
17060207-01-99	Salmon River Face 0207-01*	4,329	6.76	66.4	449.2	0.3	1.00	66.4	449.2	0.3	449.5	0.1%
	Main Salmon Total	437,954	684.30	41.7	28,536	312.8		24.4	16,664.2	152.5	16,816.8	

CEW Prescription Watersheds for Main Salmon (Partial list)				Existing Unrouted and Routed Sediment.								
Watershed #	Name	Area Acres[1]	Area Sq Mi	Unrouted Natural[1] t/mi²/yr	Unrouted Natural Yield (t/yr)	1999 Unrouted Activity Yield (t/yr)	Routing Coefficient	Routed Natural[1] t/mi²/yr	Routed Natural Yield (t/yr)	1999 Routed[2] Activity Yield (t/yr)	1999 Routed Total Yield (t/yr)	Percent Over Base
Sheep Creek CEW												
17060207-01-05	Butcher Creek	7620	11.91	61.95	737.6	0.5	0.64	39.7	472.3	0.3	472.6	0.1%
17060207-01-04	Peterson Creek	5183	8.10	31.24	253.0	0.0	0.69	21.4	173.6	0.0	173.6	0.0%
17060207-01-12	Unname No. 12	567	0.89	85.00	75.3	0.0	1.02	86.9	77.0	0.0	77.0	0.0%
17060207-01-07	East Fork Sheep Creek	4036	6.31	82.36	519.6	0.0	0.72	59.1	373.0	0.0	373.0	0.0%
17060207-01-08	Green Saddle	1361	2.13	85.00	180.8	0.0	0.87	74.2	157.8	0.0	157.8	0.0%
17060207-01-06	Slaughter Creek	2505	3.91	100.00	391.4	0.0	0.78	78.2	306.2	0.0	306.2	0.0%
17060207-01-03	Long Meadow Creek	4661	7.28	73.87	538.0	0.0	0.70	51.7	376.3	0.0	376.3	0.0%
17060207-01-13	Sheep Creek	2688	4.20	85.00	357.0	0.0	0.77	65.6	275.7	0.0	275.7	0.0%
17060207-01-32	Plummer Creek	1704	2.66	100.00	266.3	0.0	0.84	83.8	223.2	0.0	223.2	0.0%
17060207-01-30	Porcupine Creek	1850	2.89	98.50	284.7	0.0	0.83	81.4	235.2	0.0	235.2	0.0%
17060207-01-31	Unnamed No. 31	797	1.25	94.10	117.2	0.0	0.96	90.5	112.6	0.0	112.6	0.0%
	CEW Total	32974	51.52	72.22	3,720.8	0.5	0.49	35.5	1,830.1	0.2	1,830.4	0.0%
Bull Creek CEW												
17060207-02-18	Lower Bull Creek	3211	5.02	85.00	426.5	0.0	0.75	63.6	319.0	0.0	319.0	0.0%
17060207-02-19	Unnamed No. 19	914	1.43	85.00	121.4	0.0	0.94	79.7	113.8	0.0	113.8	0.0%
17060207-02-20	Hurst Creek	961	1.50	85.00	127.6	0.0	0.93	79.0	118.6	0.0	118.6	0.0%
17060207-02-21	Upper Bull Creek	1738	2.72	88.02	239.0	0.0	0.84	73.5	199.7	0.0	199.7	0.0%
17060207-02-23	Unnamed No. 23	814	1.27	21.44	27.3	0.0	0.96	20.5	26.1	0.0	26.1	0.0%
17060207-02-24	Brandon Creek	2136	3.34	51.63	172.3	0.0	0.80	41.6	138.7	0.0	138.7	0.0%
	CEW Total	9774	15.27	72.95	1,114.1	0.0	0.61	44.7	682.1	0.0	682.1	0.0%
Crooked Creek CEW												
17060207-02-01	Upper Big Creek	9626	15.04	21.00	315.9	6.2	0.61	12.9	193.9	3.8	197.7	2.0%
17060207-02-02	Upper Crooked Creek	17474	27.30	21.08	575.5	138.0	0.55	11.6	317.4	76.1	393.5	24.0%
17060207-02-03	Lower Big Creek	5307	8.29	26.62	220.7	1.6	0.68	18.2	150.8	1.1	151.9	0.7%
17060207-02-04	Jim Sandy Creek	1922	3.00	25.93	77.9	0.0	0.82	21.3	63.9	0.0	63.9	0.0%
17060207-02-05	Power Creek	807	1.26	20.54	25.9	0.0	0.96	19.7	24.8	0.0	24.8	0.0%
17060207-02-06	Fritz Creek	2466	3.85	25.83	99.5	0.0	0.78	20.3	78.1	0.0	78.1	0.0%
17060207-02-07	Lower Crooked Creek	9476	14.81	37.33	552.7	3.7	0.62	23.0	340.3	2.3	342.5	0.7%
17060207-02-15	Arlington Creek	2402	3.75	39.00	146.4	0.0	0.79	30.7	115.4	0.0	115.4	0.0%
17060207-02-22	West Fork Creek	48.55	0.08	39.61	3.0	0.0	1.59	63.0	4.8	0.0	4.8	0.0%
17060207-02-25	Jumbo Canyon	6060	9.47	43.72	414.0	1.8	0.67	29.2	276.2	1.2	277.4	0.4%
17060207-02-26	Lake Creek	11130	17.39	32.54	565.9	0.0	0.60	19.5	338.4	0.0	338.4	0.0%
17060207-02-27	Whistling Pig Creek	1704	2.66	39.65	105.6	0.0	0.84	33.2	88.5	0.0	88.5	0.0%
17060207-02-28	Upper Kelly Creek	3703	5.79	52.19	302.0	5.6	0.73	38.1	220.2	4.1	224.2	1.9%
17060207-02-29	Wildhorse Creek	1102	1.72	27.92	48.1	4.0	0.91	25.3	43.6	3.6	47.2	8.3%
17060207-02-30	Lower Kelly Creek	2051	3.20	40.40	129.5	1.1	0.81	32.8	105.0	0.9	105.9	0.8%
17060207-02-31	Pete Creek	1202	1.88	19.55	36.7	0.0	0.89	17.5	32.8	0.0	32.8	0.0%
17060207-02-32	McGuire Creek	3006	4.70	18.35	86.2	0.0	0.76	13.9	65.2	0.0	65.2	0.0%
	CEW Total	79,467	124.20	29.83	3,705.4	162.0	0.42	12.5	1,555.6	68.0	1,623.6	4.4%
Indian CEW												
17060207-02-08	Upper Indian Creek	2,720	4.25	66.7	283.5	0.1	0.77	51.4	218.5	0.1	218.6	0.0%
17060207-02-09	Moccasin Creek	1,575	2.46	67.1	165.2	0.0	0.85	57.1	140.5	0.0	140.5	0.0%
17060207-02-12	Lower Indian Creek	1,112	1.74	75.2	130.7	0.0	0.91	68.1	118.3	0.0	118.3	0.0%
	CEW Total	5,407	8.45	68.58	579.4	0.1	0.68	48.7	394.6	0.1	394.7	0.0%
Rhett CEW												
17060207-03-14	Rabbit Creek	2,804	4.38	17.6	77.1	1.1	0.77	13.5	59.1	0.8	59.9	1.4%
17060207-03-15	Upper Rhett Creek	8,247	12.89	18.6	239.4	1.1	0.63	11.7	151.1	0.7	151.8	0.5%
17060207-03-16	Lower Rhett Creek	1,297	2.03	63.0	127.6	1.1	0.88	55.4	112.3	1.0	113.3	0.9%
	CEW Total	12,348	19.29	23.02	444.1	3.3	0.59	13.5	260.7	1.9	262.6	0.7%

Wind River Ck CEW			Present sediment.													
							Existing 1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
				Unrouted	Unrouted		Unrouted[2]	Unrouted[2]	Unrouted[2]	Unrouted[2]	Unrouted[2]	Unrouted[2]	Unrouted[2]	Unrouted[2]	Unrouted[2]	Unrouted[2]
		Area	Area	Natural[3]	Natural Yield		Activity Yield	Activity Yield	Activity Yield	Activity Yield	Activity Yield	Activity Yield	Activity Yield	Activity Yield	Activity Yield	Activity Yield
Watershed #	Name	Acres[1]	Sq Mi	t/mi²/yr	(t/yr)		(t/yr)	(t/yr)	(t/yr)	(t/yr)	(t/yr)	(t/yr)	(t/yr)	(t/yr)	(t/yr)	(t/yr)
17060207-01-01	Upper Wind River	5356	8.37	17.7	148.1		1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
17060207-01-02	Anchor Ck	4832	7.55	43.8	330.7		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
17060207-01-19	Lower Wind River	3085	4.82	70.6	340.3		8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
17060207-01-23	Sand Creek	3084	4.82	35.7	172.0		8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
17060207-01-24	Meadow Creek	5313	8.30	38.4	318.8		13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7
17060207-01-25	WF Meadow Ck	1592	2.49	39.2	97.5		9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
17060207-01-26	EF Meadow Ck	1908	2.98	31.7	94.5		5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
17060207-01-27	Hangover Creek	3472	5.43	20	108.5		0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
17060207-01-28	Rock Creek	2523	3.94	22.5	88.7		0	0	0	0	0	0	0	0	0	0
17060207-01-29	Mid. Wind River	10182	15.91	46.9	746.1		0	0	0	0	0	0	0	0	0	0
	CEW Totals =	41347.0	64.6	37.85	2445.3		47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4
	CEW Routing Coefficient[2] =	0.47														
	Routed Sediment Yield (t/yr) =				1154.7		22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4
	Percent Over Base =						1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%

Footnotes:

[1] from NEZSED out_list dated 04/09/97

[2] as described in "Guide for Predicting Sediment Yield"

[3] from NEZSED 'out_totals'

Jersey Creek CEW:		only 1 watershed in this CEW; see mid_salmon										
Little Mallard Creek CEW		only 1 watershed in this CEW; see mid_salmon										
Big Mallard Creek CEW												
17060207-03-01	Noble Creek	7283	11.38	18.74	213.3	5.2	0.65	12.1	137.7	3.4	141.0	2.4%
17060207-03-02	Grouce Creek	1230	1.92	17.56	33.7	1.7	0.89	15.6	30.0	1.5	31.5	5.0%
17060207-03-03	Jack Creek	4265	6.66	17.97	119.8	15.9	0.71	12.8	85.1	11.3	96.4	13.3%
17060207-03-04	Middle Big Mallard Creek	5057	7.90	20.59	162.7	10.0	0.69	14.2	112.1	6.9	119.0	6.1%
17060207-03-05	Upper Big Mallard	4444	6.94	23.19	161.0	0.9	0.71	16.4	113.6	0.6	114.2	0.6%
17060207-03-06	South Fork Big Mallard	4622	7.22	20.16	145.6	0.0	0.70	14.1	102.0	0.0	102.0	0.0%
17060207-03-07	Bat Creek	2957	4.62	18.06	83.4	0.5	0.76	13.7	63.4	0.4	63.7	0.6%
17060207-03-09	Lower Big Mallard Creek	6672	10.43	29.87	311.4	8.7	0.66	19.6	204.2	5.7	209.9	2.8%
	CEW Total	36530	57.08	21.57	1,239.9	42.9	0.48	10.4	594.4	20.7	615.1	3.5%
Bargamin Creek CEW												
17060207-04-01	Green Mountain Creek	1676	2.62	21.35	55.9	0.6	0.84	18.0	47.0	0.5	47.5	1.1%
17060207-04-02	Upper Bargamin Creek	11730	18.33	24.18	443.2	0.0	0.59	14.3	262.6	0.0	262.6	0.0%
17060207-04-03	Hot Springs Creek	3246	5.07	22.88	116.0	0.1	0.75	17.1	86.6	0.1	86.7	0.1%
17060207-04-04	Poet Creek	2127	3.32	21.57	71.7	0.2	0.81	17.4	57.7	0.2	57.9	0.3%
17060207-04-06	Middle Bargamin Creek	10547	16.48	37.69	621.1	0.0	0.60	22.8	375.1	0.0	375.1	0.0%
17060207-04-18	Lower Bargamin Creek	8692	13.58	58.85	799.3	0.0	0.63	36.8	499.8	0.0	499.8	0.0%
17060207-04-21	Rainey Creek	3704	5.79	60.48	350.0	0.0	0.73	44.1	255.2	0.0	255.2	0.0%
17060207-04-22	Salt Creek	3241	5.06	40.19	203.5	0.0	0.75	30.0	152.0	0.0	152.0	0.0%
17060207-04-23	Cache Creek	5879	9.19	32.85	301.8	0.2	0.67	22.0	202.4	0.1	202.6	0.1%
17060207-04-24	Lake Creek	2685	4.20	48.96	205.4	0.0	0.77	37.8	158.7	0.0	158.7	0.0%
17060207-04-25	Unnamed NO. 25 Creek	1643	2.57	42.02	107.9	0.0	0.84	35.5	91.0	0.0	91.0	0.0%
17060207-04-26	Prospector Creek	2137	3.34	28.56	95.4	0.0	0.80	23.0	76.8	0.0	76.8	0.0%
17060207-04-27	Porcupine Creek	4842	7.57	23.04	174.3	2.4	0.69	16.0	121.1	1.7	122.8	1.4%
17060207-04-28	Unnamed 28	1174	1.83	21.66	39.7	0.3	0.90	19.4	35.6	0.3	35.9	0.8%
17060207-04-29	Unnamed 29	3410	5.33	27.29	145.4	0.1	0.74	20.2	107.6	0.1	107.7	0.1%
17060207-04-30	Up-Middle Bargamin Creek	3226	5.04	26.48	133.5	5.3	0.75	19.8	99.8	4.0	103.7	4.0%
	CEW Total	69959	109.31	35.35	3,864.1	9.2	0.43	15.2	1,659.9	4.0	1,663.9	0.2%
Sabe Creek CEW												
17060207-75-05	Camp Creek	1176	1.84	46.75	77.0	0.0	0.90	41.9	69.0	0.0	69.0	0.0%
17060207-75-07	Goodman Creek	1263	1.97	45.76	79.9	0.0	0.88	40.5	70.7	0.0	70.7	0.0%
17060207-75-08	Saddle Creek	2481	3.88	44.98	136.6	0.0	0.78	35.2	107.0	0.0	107.0	0.0%
17060207-75-09	Ring Creek	3590	5.61	48.65	200.1	0.0	0.73	35.7	146.7	0.0	146.7	0.0%
17060207-75-10	Brown Creek	1853	2.90	40.38	96.6	0.0	0.83	33.3	79.8	0.0	79.8	0.0%
17060207-75-11	Center Creek	2122	3.32	51.82	138.5	0.0	0.81	41.8	111.6	0.0	111.6	0.0%
17060207-75-12	Steep Creek	1513	2.36	59.46	120.4	0.0	0.86	50.9	103.1	0.0	103.1	0.0%
17060207-75-13	Canyon Creek	1093	1.71	67.14	104.1	0.0	0.91	61.0	94.5	0.0	94.5	0.0%
17060207-75-31	Sabe Creek	4163	6.50	43.56	202.3	0.4	0.71	31.1	144.4	0.3	144.7	0.2%
	NPNF Portion Total	19,254	30.08 *	39.41	1,155.5	0.4 *	0.54 *	20.8	626.1	0.2	626.4	0.0%
	Bitterroot NF Portion	33964	53.07	68.3	2,054.2		0.49	33.4	1,005.0	0.0	1,005.0	0.0%
	CEW Total	53218	83.15	106.7	3,209.7	0.4	0.45	48.1	1,448.4	0.2	1,448.6	0.0%
	*Includes acreage on Red River Ranger District											
Footnotes:												
	[1]from NEZSED out_list dated 04/09/97											
	[2]as described in "Guide for Predicting Sediment Yield"											
	[3]from NEZSED 'out_totals'											

Appendix 3

Summary of Restoration Efforts

Mid Salmon River Subbasin (17060207) Restoration Efforts
Red River Ranger District - 1992-1997
Summary by Bob Vermey - 3/6/00

PROJECT NAME & DESCRIPTION	SUBWATERSHED	YR COMPLETED
Road 311F Eutopia Creek Improvements - french drain installed - 1 ford hardening - 30 waterbars installed - seeding and fertilizing of disturbed areas	170602070201	completed 1995
Drainage Improvements on Roads 9527, 9527B, 9527D, 222C, 222C1, 22C3 - 14 miles road obliteration, waterbars, french drains, sediment traps, seeding and fertilizing	170602070202	completed 1993
222C2 Watershed Improve. Planting of Mining Area - 3 acres planted with trees	170602070202	completed 1994
Crooked Creek Bank Stabilization - 5 acrea planted along creek	170602070202	completed 1994
Road 1188 Burpee Cutbank Planting - 11 acres cutbank tree planting - 11 acres straw mulching	170602070202	completed 1994
Boulder Creek Road Improvements - 10 waterbars constructed/reconstructed - road seeded (~1.25 miles)	170602070202	completed 1995
Road 1188 Burpee Road Slump Removal - slump removal	170602070202	completed 1995
Road 9537 Long Tom Spur Reconstruction - .25 miles road reconstructed - .25 miles waterbars installed - creek rediverted into original channel - .25 miles shrubs and sedges transplanted - .25 miles seeding road	170602070202	completed 1995
Wakefield Mine Ditch Diversion - rediverted creek in 2 spots	170602070202	completed 1995
Robinson Dyke road 9537, 9537A and 9538 Drainage - 2640 feet minor road reconstruction - 2640 feet waterbars installed	170602070202	completed 1996

PROJECT NAME & DESCRIPTION	SUBWATERSHED	YR COMPLETED
Robinson Dyke Road Obliteration - 8962 feet road recontoure & wood/debris placement - 3 culverts removed - 8962 feet seeded and fertilized	170602070202 170602070315	completed 1996
Swastika Road 222D Drainage Improvements - waterbarred entire road (5 ac.)	170602070202	completed 1996
Road 222 Stabilization - 2 miles slash filter windrow construction - 2 miles aggregate placement - 6 culverts installed - 5 acres seeding and fertilization	170602070202	completed 1997
Road 311 Drainage Improvements - 12 miles road blading - 80 waterbars installed - 30cubic yards aggregate placement	170602070202 17060207 0203 17060207 0204	completed 1997
Road 9527/9528 Ford Hardening - 5 units ford hardening - 10 waterbars repaired	170602070202	completed 1997
Road 421 Planting and Sediment Traps - straw bale sediment traps and windrows - cutbank and fill shrub and forb planting (54 acres)	170602070301 170602070303 170602070309	completed 1993
1190B, B3 Hydroseeding - 6.3 acres cutbank and fillslope hydroseeding	170602070301	completed 1994
Road 421 Cutbank Planting - .5 acres shrub planting	170602070301 170602070303 170602070309	completed 1994
1190D/1190D1 Culvert Removal / Road Oblit. - .25 miles wood/debris on road - 1.25 miles culverts pulled - 2 barricades installed - 1 acre mulching and netting	170602070301 170602070302 170602070303	completed 1995
Bagley/Noble Road 1190B1 Drainage - .7 miles waterbars installed - aggregate placement at creek crossing	170602070301	completed 1996

PROJECT NAME & DESCRIPTION	SUBWATERSHED	YR COMPLETED
Grouse T. S. Area Cutbank Planting - 5 acres shrub planting	170602070301	completed 1996
Jeep Trail Obliteration, 1190B Parallel - .35 miles road obliterated with wood/debris placement - .35 miles waterbars installed	170602070301	completed 1996
Grouse Creek Culvert sediment Reduction Implem. - 2 acres straw bale sediment traps and log weirs in creek	170602070302	completed 1992
1190E Hydroseeding - 8 acres cutbank and fillslope hydroseeding	170602070302 170602070303	completed 1994
1190E Improvements - 1 acre shrub and tree planting	170602070302 170602070303	completed 1996
Road 468 Montana Road Hydroseeding - 1.6 acres cutbank and fillslope hydroseeding	170602070305	completed 1993
Road 468M Montana Rd Spur Cul Rem and Scarif. - wood culvert removal and area seeding - wood /debris placed on road - seed and fertilize road (1 acre) - tank trap construction - 1 acre tree and shrub planting	170602070305	completed 1995
Little Mallard Meadows - built fence to prvent vehicle access into wet meadow	170602070310	completed 1992
9505 and Spurs A,B,C,E Straw Mulching - 33 acres machine cutbank and fillslope straw mulching with tackifier	170602070310	completed 1994
Black Sands Watershed Improvements - 4.5 acres planted in mining disturbance	170602070310	completed 1994
222N Access Restrictions and Improvements - entire road waterbarred (? miles) - gated - seeded road (? miles)	170602070310	completed 1995
Robinson Dyke Planting and Channel stabilization - 12 acres tree planting - 12 acres seeding and fretilizing - log weir placement (several)	170602070315	completed 1994

- reshape 1 headcut

PROJECT NAME & DESCRIPTION	SUBWATERSHED	YR COMPLETED
222D1 Comstock to Swastika Mine Drainage - aggregate placement at creek crossing - 2 miles waterbars installed - bridge removal	170602070315	completed 1995
Road 222D Lower 1/4 Mile - .25 miles waterbars installed - 1000 feet road seeded and fertilized	170602070315	completed 1995
222D Comstock to Rhett Creek Improvements - .5 miles seeding - .5 miles waterbars installed	170602070315	completed 1996
222P Buckhorn Meadows Improvements - 7920 feet waterbar installation - 7920 feet seeding and fertilization	170602070322	completed 1995
Jersey Ridge Trail #214 Drainage - 1 mile waterbars installed	170602070322	completed 1996
Crofoot Jeep Trail - 60 rock and wood waterbars installed (1 mile)	170602070417 170602070499	completed 1995
Burntknob - 3 miles road blading	170602070428 170602070429 170602070430	completed 1997
1190B Road Obliteration - rip and till 2640 feet - waterbar, seed and drainage removal 2640 feet	17060207????	completed 1996
222D Road Coppernoll/North Star - 1 mile drainage installation	17060207????	completed 1994
Moccasin Mountain Jeep Trail Obliteration - 2 miles recontour road - 2 miles seeding and fertilizing road - 2 miles waterbars installed	17060207????	completed 1993